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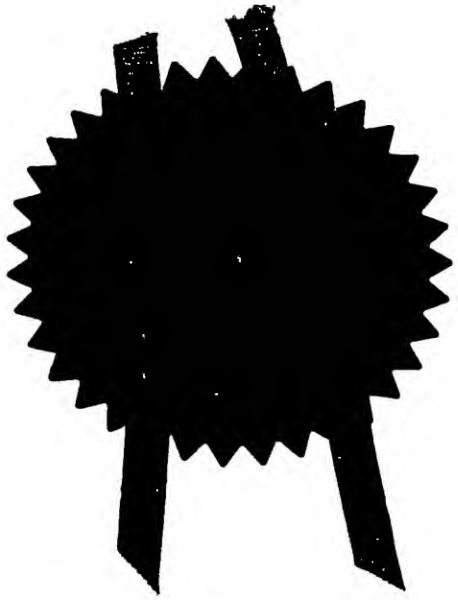

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~~8743458003~~
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TAPE PRINTING APPARATUS AND TAPE CASSETTE

5. Name of your agent *(if you have one)*

"Address for service" in the United Kingdom to which all correspondence should be sent *(including the postcode)*

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Country	Priority application number *(if you know it)*	Date of filing *(day / month / year)*
GB	0315148.7	27/06/2003

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Number of earlier application	Date of filing *(day / month / year)*

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b) there is an inventor who is not named as an applicant, or
c) any named applicant is a corporate body.
See note (d))

Yes

DUPLICATE

TAPE PRINTING APPARATUS AND TAPE CASSETTE

The present invention relates to a tape printing apparatus, a tape supply for a tape printing apparatus and also to a tape cassette with a tape supply for use in a tape printing apparatus. In particular, the present invention relates to a tape printing apparatus for direct thermal printing, a tape supply comprising a tape of direct thermal media for use with a tape printing apparatus and to a tape cassette housing said tape for use in a tape printing apparatus.

Tape printing apparatus utilising direct thermal printing are known in the art. For example, the Casio KP-C10 comprises a printer for use with a PC. This printer has a tape receiving portion for receiving a roll of thermal paper tape, a platen and a thermal print head, wherein, during operation, the platen rotates and the tape passes between the platen and the print head with the print head heating the tape so as to form an image on the tape. However, this printer is only capable of printing black images on a white thermal tape.

Tape printing apparatus for colour printing have been suggested. However, these apparatus utilize cassettes having coloured ink ribbons with the coloured ink being transferred from the ink ribbon to a receiving tape using a thermal print head. For different coloured images, multiple ink ribbons of different colours are required. These may be loaded into a printer at the same time which increases the size of the apparatus. Alternatively, printing may be suspended and the ink ribbon replaced with a different colour before continuing printing in order to produce a different coloured image. This arrangement increases the time required to produce different coloured images. Also, these printers do not produce full colour images but rather print in one colour and then print in a different colour.

In an alternative arrangement, EP-A-0,641,663 discloses a tape printer capable of forming multi-colour printing utilising a single tape cassette and ink ribbon. The tape cassette is housed in the tape printer and comprises a print tape and an ink ribbon formed from different coloured ink portions at a set pitch in the lengthwise direction of the print tape. The

independently by a thermal print head by controlling the temperature of the thermal print head and the time thermal energy is applied to the image-forming layers. Each colour of the thermal imaging member can be printed alone or in a selectable portion to the other colours. That is, the temperature-time domain is divided into regions corresponding to the different colours it is desired to combine in a final print. Figure 2 is a graphical representation illustrating the temperature and time parameter features of such a direct thermal media for printing magenta, cyan and yellow. The temperature selected for the colour forming regions generally are in the range of from about 50°C to about 450°C. The time period for which the thermal energy is applied to the colour forming layers of the imaging member is preferably in the range from about 0.01 to about 100 milliseconds.

A number of image-forming techniques may be exploited including thermal diffusion with buried layers, chemical diffusion or dissolution in conjunction with timing layers, melting transitions and chemical thresholds.

Referring now to Figure 3, there is seen a pre-colour thermal imaging member that utilises thermal delays to define the printing regions for the colours to be formed. The three colour imaging member 14 includes substrate 16, cyan, magenta and yellow image-forming layers, 18, 20, 22, respectively, and spacer interlayers 24, 26.

Where the image member is heated by a thermal print head from above, the cyan image-forming layer 18 will be heated almost immediately by the thermal print head after the heat is applied, but there will be a significant delay before the magenta image-forming layer 20 and the yellow image-forming layer 22 are heated according to the thermal conductivity and thickness of the spacer layers 24, 26. To provide multicoloured printing it is preferable that each image-forming layer is arranged to be activated at a different temperature. This result can be achieved, for example, by arranging the image-forming layers to have different melting temperatures or by incorporating in them different thermal solvents, which will melt at different temperatures and liquefy the image-forming materials. For example, if the

According to the present invention, there is further provided a method of printing a label comprising driving a direct thermal tape passed a thermal print head and controlling the print head whereby a multicoloured image is produced on the tape by direct thermal transfer in a single pass.

Embodiments of the present invention provide a tape printing apparatus and a tape cassette/tape capable of printing monochromatic images of continuously variable optical density and/or full multicoloured images using direct thermal printing.

For a better understanding of the present invention and as to how the same may be carried into effect, reference will now be made, by way of example, to the accompanying drawings in which:

Figure 1 shows a schematic diagram of a prior art arrangement for direct thermal printing.

Figure 2 shows a graphical representation of the temperature-time domain for a prior art photographic medium, the temperature-time domain being divided into regions corresponding to the different colours it is desired to combine in a final print

Figure 3 shows the prior art photographic medium utilized to produce the divided temperature-time domain indicated in Figure 2.

Figure 4 shows a schematic diagram of an embodiment of a tape printing apparatus according to the present invention;

Figure 5 shows a schematic diagram of an embodiment of a cassette receiving bay of the tape printing apparatus shown in Figure 4;

Figure 15 shows schematically control circuitry for controlling a tape printing device embodying the present invention;

Figure 16 shows a schematic cross sectional view of a tape printer embodying the present invention;

Figure 17 shows an example of two labels separated by a full cut with one of the labels having a partial cut;

Figure 18 shows schematically an arrangement for providing the full cut and partial cut of figure 17;

Figure 19 shows a label with background printing;

Figure 20 shows schematically the arrangement for printing a background image on a tape;

Figure 21 shows schematically the arrangement for printing a background image on a die cut label; and

Figure 22 illustrates an method for providing the labels of Figure 17.

Figures 1 to 3 indicate prior art and have already been discussed in the pre-amble of this specification.

Figure 4 shows a schematic diagram of an embodiment of a tape printing apparatus 28 according to the present invention. The tape printing apparatus comprises a keyboard 30 and a cassette receiving bay 32. The keyboard has a plurality of data entry keys 34 such as numbered, lettered and punctuation keys for inputting data to be printed as a label

able to pivot about a pivot point 324 so that it can be brought into contact with the platen 308 for printing and moved away from the platen 308 to enable the cassette 306 to be removed and replaced. In the operative position, the platen 308 is rotated to cause the image receiving tape 310 to be driven past the print head 304.

The platen 308 is driven by a DC motor (see Figure 15) so that it rotates to drive the image receiving tape 310 through the print zone 302 of the tape printing device 301 during printing. In this way, an image is printed on the tape and fed out from the print zone 302.

The image is printed by the print head 304 on the image receiving tape 10 on a column by column basis with the columns being adjacent one another in the direction of movement of the tape 310. Pixels are selectively activated in each column to construct an image in a manner well known in the art. The DC motor is provided with a shaft encoder for monitoring the speed of rotation of the motor. The control of the speed of the motor is achieved by the microprocessor chip 100 (see Figure 15) to generate data strobe signals each of which causes a column of pixel data to be printed by the print head 304.

The tape printing device may include at cutting location 320 a cutting mechanism 328 which carries a blade 318. The blade 318 cuts the image receiving tape 310 then enters a slot 330 located in the cassette 306.

It is understood that other embodiments of the tape printer may be envisaged. For example, the tape printer of the present invention may be a PC printer rather than a stand-alone printer. In such a printer, a keyboard and display means are not essential as the data may be input and displayed on the PC. The PC then acts as an input device for the printer. Alternatively, other apparatus may be used to input data to the printer for printing. For example, in an embodiment of the invention a digital camera may be used to input data to the tape printing device for printing. Images may alternatively be input using a smart card, chip card, memory card or the like.

light tight as excessive exposure of light to some tapes may have an adverse effect. In some embodiments of the invention, the tape is wound on the tape supply roll so that the thermally sensitive surface is inwards of the tape with the backing layer radially outwards.

The direct thermal tape for use in the tape printer embodying the present invention comprises direct thermal printing media of the type utilized in the field of photography and discussed in the pre-amble of this specification with reference to Figures 1 to 3. While conventional tape printers capable of colour printing utilize separate donor and receiver tapes, in the present invention the thermally activated chemistry is incorporated into a single tape. Figure 8 shows a schematic diagram of direct thermal tape according to an embodiment of the present invention. The tape comprises a removable base layer 70, an adhesive layer 72, a substrate layer 16, a print layer 73, and an overcoat layer 74. The print layer comprises a plurality of colourless dye precursors in order to form a direct thermal tape capable of producing a full multicoloured image. In this embodiment the different colourless dye precursors are provided in separate image-forming layers 18, 20, 22 with spacer interlayers 24, 26. After printing a label, the removable base layer may be removed to expose the adhesive layer for attachment of the printed label to a surface.

During printing, the print control means in the form of a processor controls the print head whereby dyes of different colours are selectively reacted to produce a multicoloured image. The criteria for selective reactivity depend on the thicknesses of the tape layers, the thermal conductivity of the layers, the temperature coefficients of reaction for the dye precursors, the heating temperature and the heating time. It is envisaged that a number of image-forming techniques may be exploited including thermal diffusion with buried layers, chemical diffusion or dissolution in conjunction with timing layers, melting transitions and chemical thresholds. Selective light activated reactions may also be utilized in order to achieve multicolour colour printing.

The above-described embodiments enable a method of printing a label in which a multicoloured image is produced on the tape by direct thermal transfer in a single pass of the tape past the print head. In particular, the use of such a method solves the problem of alignment between an ink ribbon and a receiving tape and also solves the problem of ink ribbon creasing. As a result, higher quality colour images are achieved.

Reference is now made to Figure 9 which shows four examples of face material which can be used in embodiments of the present invention. Some of these embodiments are the same or similar to those embodiments described previously. In the following, those layers which are the same are referenced by the same reference numbers.

Reference is made first to Figure 9a. In this arrangement, there is a clear carrier film 106. On one side of the clear carrier film is a layer 108 containing cyan dye or the like. Overlying that cyan layer 108 is a bottom over-layer 110. This is a protective layer which may be a polymeric binder in which small molecules are dissolved or dispersed.

On the other side of the clear carrier film is a layer 104 containing magenta dye. On top of that magenta layer is a further layer containing yellow dye 102. That yellow layer 102 is overlaid by a protective over-layer 100 which is similar to the bottom over layer 110. This defines a first face material 116a.

Reference is now made to Figure 9c. This face material construction 116c has a similar construction to that shown in Figure 9a. However, the over-layer 100 has been replaced by a clear protection film 112. The clear protection film 112 is adhered to the layer containing the yellow dye by an adhesive layer 114. That adhesive layer is clear. The clear protection film may be a thin transparent layer of polyolefin or polypropylene or any other suitable material, typically having a thickness of a range 3 to 15 micro metres for example.

Reference is made to Figure 10 which now shows various embodiments of the label material and how it is used in label in label printers in preferred embodiments of the present invention.

Reference is now made to Figure 10a which shows an embodiment. In this embodiment, two supplies of material are used. The first supply 128 comprises the face material 116. To the bottom over-layer or clear carrier film is applied a layer of white ink 118.

The second supply of material comprises a double sided silicon liner 122. One side of the silicon liner layer 122 is provided a layer of white adhesive 120. As can be shown seen from Figure 10a, the first supply 128 is provided on a roll. In use, once a label has been printed, the thin silicon liner layer can be removed. This will leave the white adhesive layer exposed and the label can be stuck to any suitable surface. In alternative embodiments of the present invention, the adhesive layer may not be white.

The label material 124 of Figure 10a may be provided in a roll 124. Depending on the embodiment of the present invention, the roll may be accommodated in a tape cassette as discussed previously. However, this is not necessary and in alternative embodiments of the present invention, the label material may be provided simply in a roll. The label material is then provided to a print station 126 where printing can be carried out. Various examples of print stations will be described later. The second supply material 130 is also provided in a roll or alternatively in a cassette. In some embodiments of the present invention, a common cassette may be provided for both of the supplies 128 and 130. The material 130 is provided together with the material 128 to a pair of rollers 132 and 134. These rollers act together to apply the white adhesive and silicon liner material 130 on one hand to the face material and white ink layer on the other hand, to thereby provide a single label. The white ink layer 118 is adhered to the white adhesive layer 120.

In the arrangement of Figure 11a, the print head is fully addressable. This means that the print head contains n printing elements each of which is separately controllable. Effectively, this means that a drive circuit is provided for each printing element so that for any given printing operation the printing element can be controlled to be on or off. In Figure 11a the print head has a height x which corresponds to the maximum width of label to be used with the tape printer. In general, the text will have a maximum height y which is less than the maximum label height x. The term text is used to refer to any image which is printed over a background image and may be text, symbols, numbers, graphics, drawings or the like. This is because there will generally be a space above and below the characters on a label. It should be appreciated that the term "text height" refers to the height of a line of text where the label contains a single line of text or where the label contains more than one line, the height from the top of the first line to the bottom of the last line.

Reference is made to Figure 11b which shows a modification to the arrangement of Figure 11a. The arrangement of the Figure 11b shows two print heads 148 and 154 in conjunction with respective platens 150 and 152 in a similar arrangement to that shown and described in relation to Figure 11a.

Reference is made now to Figure 12 which shows how the print heads of Figure 11b are controlled. In Figure 12, six printing elements 180a-f are shown. This is highly schematic. In practice many more than six printing elements 180 are provided. These printing elements 180 have together provide a height x which is equal to the maximum width of tape used with the tape printer. Pixels 180c and 180d together provide the part of the print head will be used to print text and thus have a height y. This means that the two pixels 180a and 180b above the two pixels 180c and 180d will be used to provide an image above the text and the two pixels 180e and 180f will be used to provide the image below the text. Typically this image will be a background colour, background pattern or the like as will be discussed in more detail hereafter. In the embodiment shown in Figure 11d, the pixels which are used to

In the arrangement shown in Figure 11c, the text is printed on to the tape using a print head 173 in conjunction with a platen 172. The print head will have the same print head structure as described in relation to Figure 11a.

The tape will then be provided to a two print head arrangement comprising a first print head 168 and associated platen 164 and a second print head 160 and associated platen 162. This arrangement is the same as described in relation to Figures 11a and b. However, in the arrangement shown in Figure 11c, the print heads are arranged to provide a colour background. Accordingly, the print head has a very much simpler construction in that all of the printing elements are controlled to be either on or off and if on, the energy level and duration is appropriately controlled dependent on the required colour. It should be appreciated that the print head can in effect be replaced by an element which can be heated up to the required temperature for the required duration. The term print head is intended also to cover any such element.

Figure 11d shows a modification to the arrangement of Figure 11c in that the two print heads are now arranged to be aligned with each other so that the need for the platens can be removed. The two print heads 174 and 176 have the same construction as the print heads 160 and 168 described in relation to Figure 11c.

The arrangements shown in Figures 11c and 11d can be modified so that a single background applicator in the form of a single print head is provided. Thus the arrangements shown in Figures 11c and 11d can be simplified to provide two print heads. One print head is arranged to provide the text or the like on the label and the other print head is arranged to provide the background colour or image. The position of the print head will be determined by the nature of the material. For example, if the full colour image can be achieved by print heads acting from the same side of the material, then the print heads can be provided side-by-side. Alternatively, if the material is such that printing can be achieved from either side of the

ENTER key. This would then provide the menu shown in Figure 13b. The user is able to scroll through the various different colours available to the user. To select a colour, the user would activate a confirmation key such as an OK key or ENTER key. This would then take the user back to the menu shown in Figure 13a. The user can then move the cursor down to the text option. If the confirmation or OK key is actuated, then the menu shown in Figure 13c will be displayed. In the same way as described in relation to the background colour, the text colour can be selected. Once the OK key has been pressed, then the user returns to the menu shown in Figure 13a. A further actuation of the OK or confirmation key will take the user back to the edit screen and the user can input an image to be printed.

In one embodiment of the present invention, the menu shown in Figure 13a may show the currently selected colours for the background and text.

In another embodiment of the present invention, the display may be a colour display and when the user inputs text, the text will have the selected colour on the display. Likewise, the background of the display will also have the required colour.

It should be appreciated that some displays may only be able to display one or two lines of text. In that case, the menus shown in Figure 13a would not be displayed but the options would be viewed by the user moving the cursor downwards.

In some embodiments of the present invention, the tape printer may be connected to a PC. In those embodiments, the tape printer may not have a keyboard or display. However, in some embodiments the tape printer will additionally have the display and keyboard. In the embodiments where the tape printer is connected to a PC, relatively complicated colour images can be downloaded from the PC to the tape printer for printing. These can be full colour images.

colour options and if so what those colour options are. This information can be provided in a number of different ways. For example, the tape supply and/or cassette may have an element which provides the necessary information. In alternative embodiments of the present invention, the user may be able to set this from the keyboard. In other words, the user will provide the tape printer with information as to the type of tape material so that the tape printer can be controlled accordingly.

In embodiments of the preset invention, when the tape printer has received information that a colour direct thermal material is provided, then it can for example automatically display the colour and background text menu shown in Figure 13a so that the user can keep the current settings or change those settings.

Reference is made to figure 17 which shows two labels 400 and 402. Label 400 has been heated to provide a first background colour whilst the second label 402 has been heated to provide a different background colour. As indicated by reference 404, there may be a region between the two labels where the colour is a blend between the two colours or the boundary between the colours is not clear. It may be difficult in practice to achieve a clean line between two colours. To address this problem, the region 404 is bounded on one side by a first cut 406 and on the other side by cut 408. Both of these cuts may be full cuts, that is the cut extends through the tape and any backing tape in its entirety to fully separate the two labels. In preferred embodiments of the present invention, one of these cuts is a partial cut, that is the cut is made only through part of the tape which is to be adhered to the surface and not the backing layer which is discarded. This partial or tab cut is in itself advantageous in that it is easy to remove the label from the backing tape.

In some embodiments of the present invention, the two cuts may be partial cuts. This may be desirable where a strip labels is required to be printed, where the labels are not completely separated. This may make for ease of transport. Each of the labels may be

In alternative embodiments of the present invention, the cutting operation can be a two stage operation, with a single blade providing the full cut and the partial cut.

Reference is made to Figure 22 which shows a detailed example of the implementation of one embodiment of the invention. Shown in Figure 22 are the relative positions of a first print head 600 and associated platen 602. Downstream of the first print head 600 is a second print head 604 and its associated platen 608. Downstream of the second print head 604 is the tab cut blade 610. Downstream of the tab cut blade 610 is the full cut blade 612. The various steps performed are shown with the position of the tape relative to the components shown.

In step S1, the tape has a tab cut 614 and down stream of the tab cut portion is part of the background 616 used in the previous label.

In step S2, the tape is reversed so that the first print head can start printing the background image for the next label between the tab cut and end of the label. The tab cut needs to be positioned before the first printing line for the background image.

In steps S3 – S5, the background image of the label is printed. When the tape reaches the second print head, the overlying image is printed as shown in step S5. The background printing and printing of the overlying image can take place at the same time but on different parts of the tape.

In step S6, the background image has been completed so the first print head is inactive. The second print head continues to print until the overlying image has been completed.

In step S7, the label on which both the background image and the overlying image has been printed is fed to the cutting position and the tab cut blade activated.

In embodiments of the invention, applied to die cut labels, the print head may be controlled to print over a length slightly greater than the width of the label. In this embodiment, the print head may simply end up printing on the label liner. This is illustrated in Figure 21. The print head 500, print head holder 504, the platen 508 and platen holder 508 are as shown in Figure 21. The height of the print head is 502, the height of the label is 516 and the height of the label liner 520 is 518. The print head is controlled to print a background image at least the same height as the label and preferably slightly greater. The height of the image is preferably less than the height 518 of the label liner.

It should be appreciated that embodiments of the invention are applicable to continuous tape and also, where appropriate die cut labels arranged on a continuous backing layer.

at least one print head, said print head having a plurality of printing elements, wherein at least some of said printing elements are individually controllable and at least some of said printing elements are divided into at least one group which are commonly controlled.

8. A label printer for printing on a direct thermal tape in a plurality of colours, said label printer comprising;

at least one print head, said print head having such that the print head can print across the entire width of said tape, said print head having a plurality of printing elements which are individually controllable, said individually controllable printing elements corresponding to a part of the print head which is arranged to print an image on said tape and at least one group of printing elements which are commonly controlled and which correspond to a part of the print head which is arranged to print a background on said tape between said image and at least one of said upper and lower edges of said tape.

9. A tape supply for use in a tape printing apparatus, said tape supply comprising a roll of direct thermal image tape, said direct thermal image tape comprising a plurality of thermally activated colourants and at least one developer for producing a multi coloured image on said direct thermal image tape when said direct thermal image tape is heated.

10. A tape supply for use in a tape printing apparatus, said tape supply comprising a roll of direct thermal image tape, said direct thermal image tape comprising at plurality of thermally activated colourants and at least one developer for producing a multi coloured image on said direct thermal image tape when said direct thermal image tape is heated, said tape further comprising an outer protective layer.

11. A tape supply as claimed in claim 10, wherein said protective layer comprises polyolefin or polypropylene.

21. A tape supply as claimed in any of claims 9 to 20, wherein said tape comprises a substrate layer, and a print layer comprising an image-forming layer..

22. A tape supply as claimed in claim 21, wherein said image-forming layers comprise one or more of a dispersion of solid material, an encapsulated liquid, amorphous materials, solid materials, solutions of activatable materials and polymeric binders.

23. A tape supply as claimed in any of claims 9 to 22, wherein the tape comprises an upper image-forming layer being selectively activatable to produce a colour by applying heat to the tape at a temperature T1 for a time period t1 and a lower image-forming layer being selectively activatable to produce a colour by applying heat to the tape at a temperature T2 for a time period t2 wherein $T1>T2$ and $t1<t2$, whereby in use either of the upper or lower layers can be activated separately from the other.

24. A tape supply as claimed in any of claims 9 to 23, wherein said tape comprises a plurality of image-forming layers, wherein each respective image-forming layer contains a different thermally activated colourant.

25. A tape supply as claimed in claim 24, wherein said tape comprises one or more spacer layers, each spacer layer being disposed between said image-forming layers.

26. A tape supply as claimed in claim 25, wherein the one or more spacer layers comprise one or more of a thermally inert material, a material which undergoes a phase change on heating by a thermal print head, a thermal solvent and a polymeric material.

27. A tape supply as claimed in claim 25 or claim 26, wherein the thickness and the thermal conductivity of the one or more spacer layers is selected whereby in use any one of the thermally activated colourants can be individually activated to produce a colour without activating the other thermally activated colourants.

35. A tape printer comprising a tape supply receiving portion for receiving a supply of tape, a print head comprising a plurality of printing elements for printing an image on a tape, a drive means for driving a tape passed the print head and a control means for controlling the plurality of printing elements, wherein the control means is adapted to control the printing elements for producing a multicoloured image on a tape by direct thermal transfer.

36. A tape printer according to claim 35, wherein said control means is adapted to produce a multicoloured image on a tape by direct thermal transfer in a single pass.

37. A tape printer according to claim 35 or claim 36, wherein said control means is adapted to control the printing elements according to data input to the tape printer.

38. A tape printer according to any one of claims 35 to 37, wherein said control means is a processor.

39. A tape printer according to any one of claims 35 to 38, wherein said control means is adapted to control the temperature of each printing element.

40. A tape printer according to any one of claims 35 to 39, wherein said control means is adapted to control the time period each printing element is heated.

41. A tape printer according to any one of claims 35 to 40, wherein said control means comprises a memory storing at least one of temperature, heating period and colour data which is accessible to select a temperature and heating period for each printing element according to data input to the printer.

42. A tape printer according to any one of claims 35 to 41, wherein said memory stores at least one of temperature, heating period and colour data for different types of direct thermal tape.

51. A printer as claimed in claim 50, wherein said reversing means are arranged to reverse said medium from the cutting means to said at least one print head.

52. A printer as claimed in any of claims 47 to 51, wherein at least one of said at least one print heads is arranged to start printing an image on said image receiving medium on one side of a partial cut provided by said cutting means and to continue printing on the other side of said partial cut.

53. A printer as claimed in any of claims 47 to 52, wherein said cutting means is arranged to provide a cut, said cut being at a position such that one background extends both sides of said cut.

53. A printer as claimed in claim 52, wherein said one background extends only a relatively small distance on one side of said cut.

54. A printer as claimed in any of claims 47 to 53, wherein at least one print head is arranged to print backgrounds on said first and second labels in different colours.

55. A label printer for printing an image, said label printer comprising:

at least one print head for printing on a tape a first image for a first label and a second different image for a second label, said first and second labels being adjacent; and

cutting means for providing a cut on either side of a region between said first and second labels, where said first and second images meet.

56. A method of printing an image comprising the steps of:

printing a first label on a supply of continuous tape; and

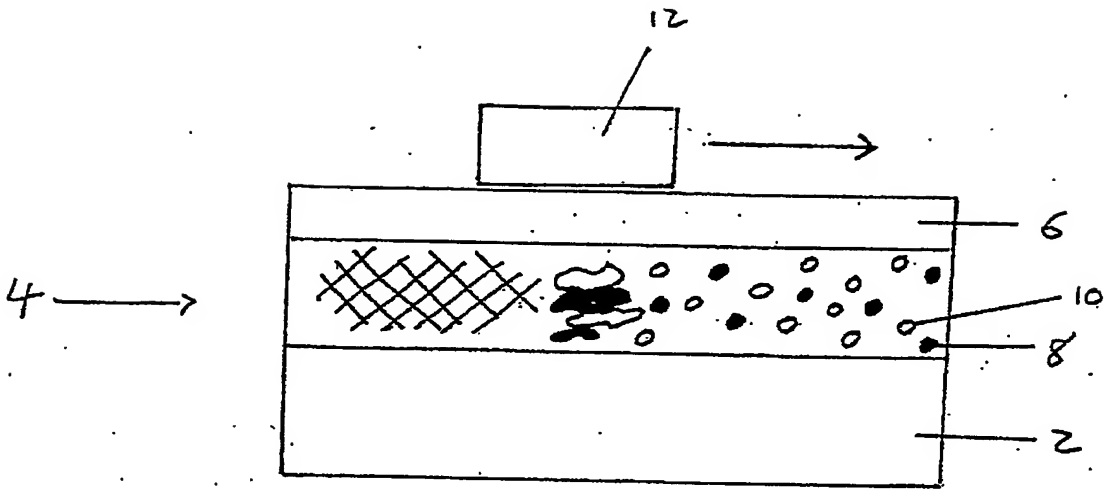


FIG 1

PRIOR ART

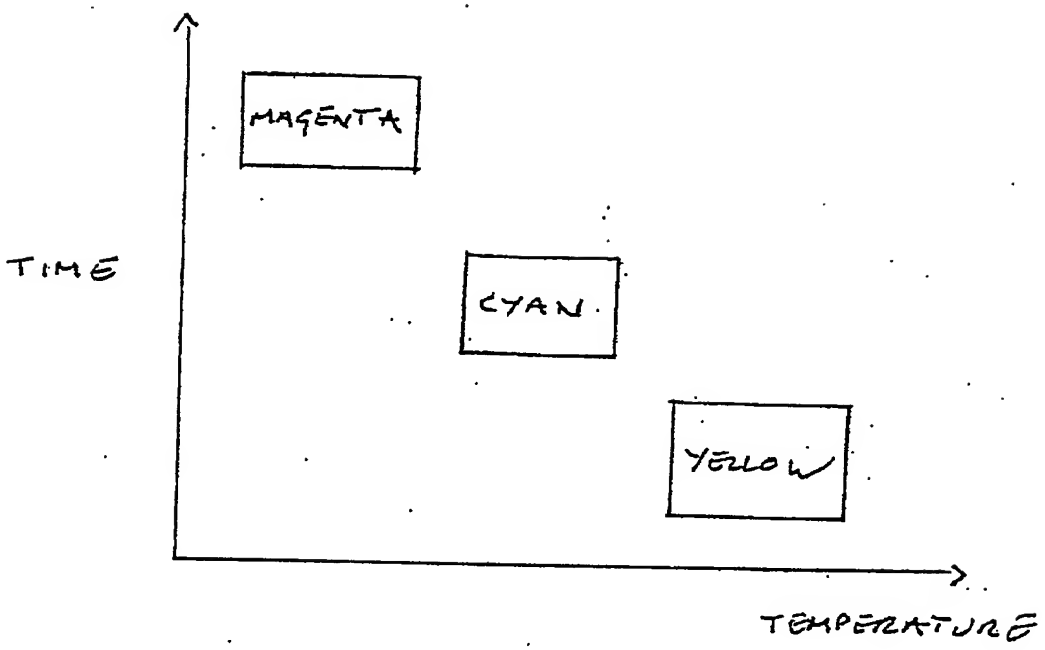


FIG 2

PRIOR ART

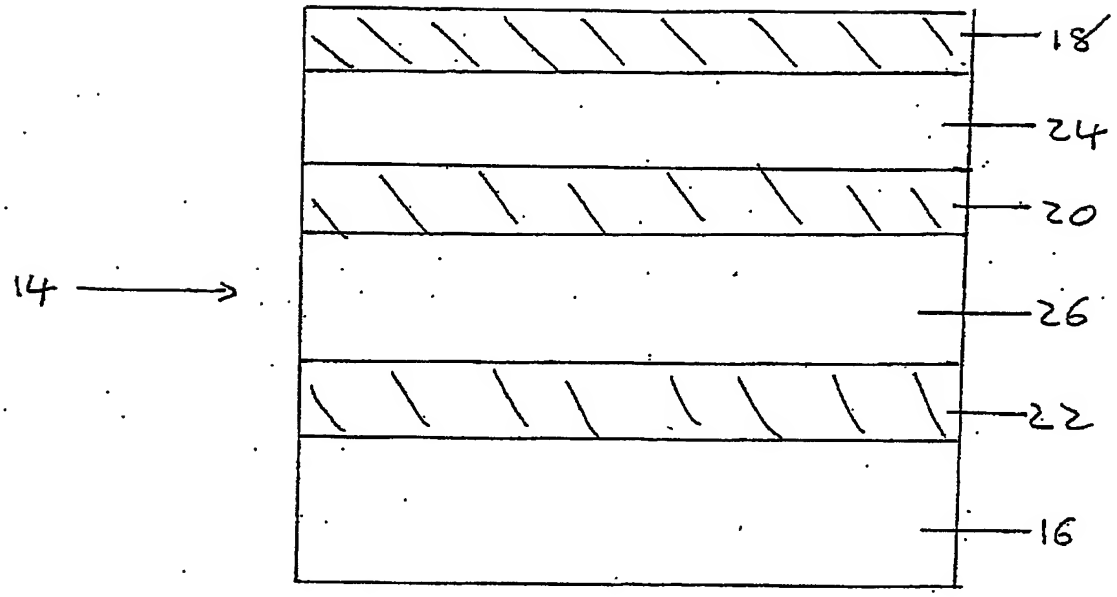


FIG 3

PRIOR ART

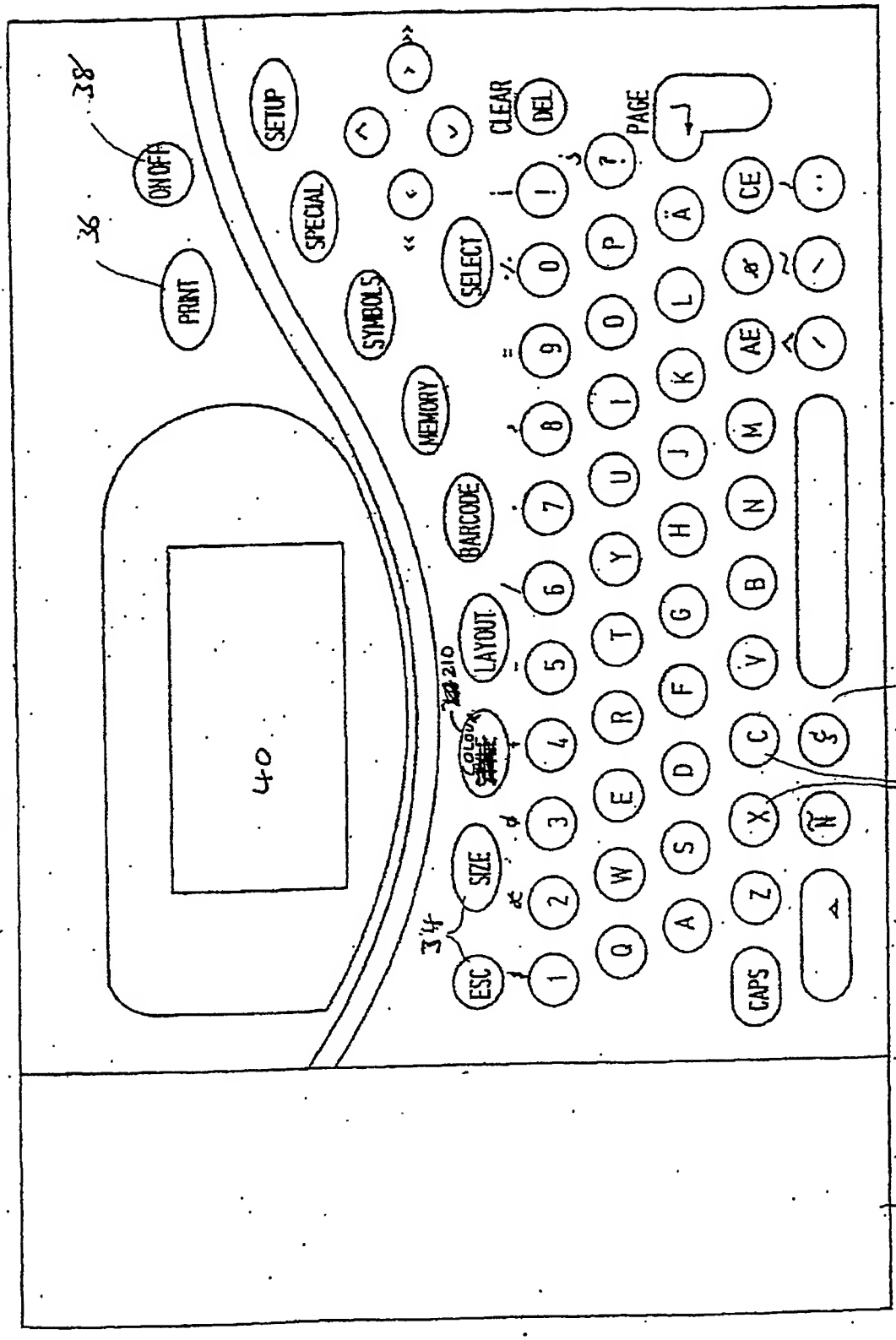

28
38
36
ON/OFF
PRINT
SETUP
SPECIAL
SYMBOLS
MEMORY
BARCODE
LAYOUT
SELECT
CLEAR
DEL
PAGE
40
210
ESC
SIZE
CAPS
CE
34
32
30

Fig 4

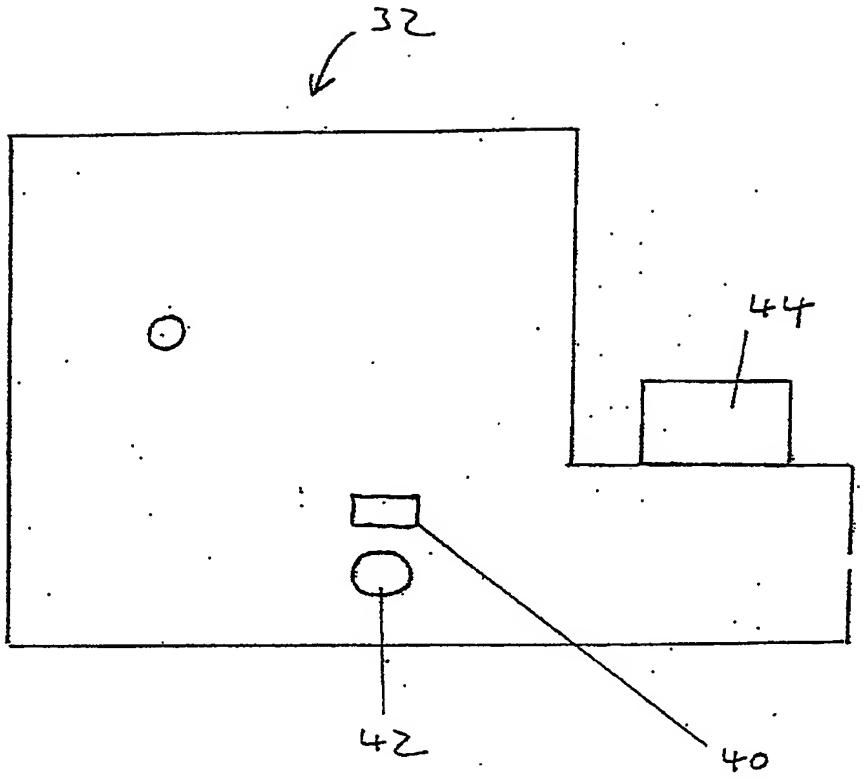


FIG 5

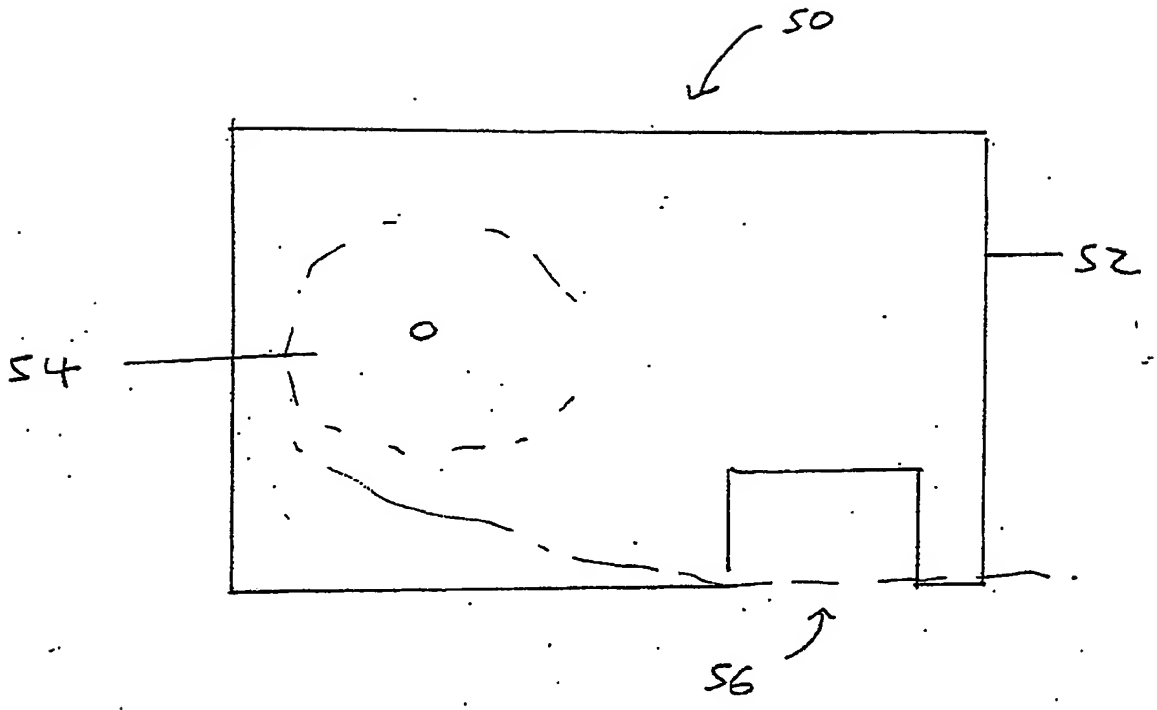


FIG. 6

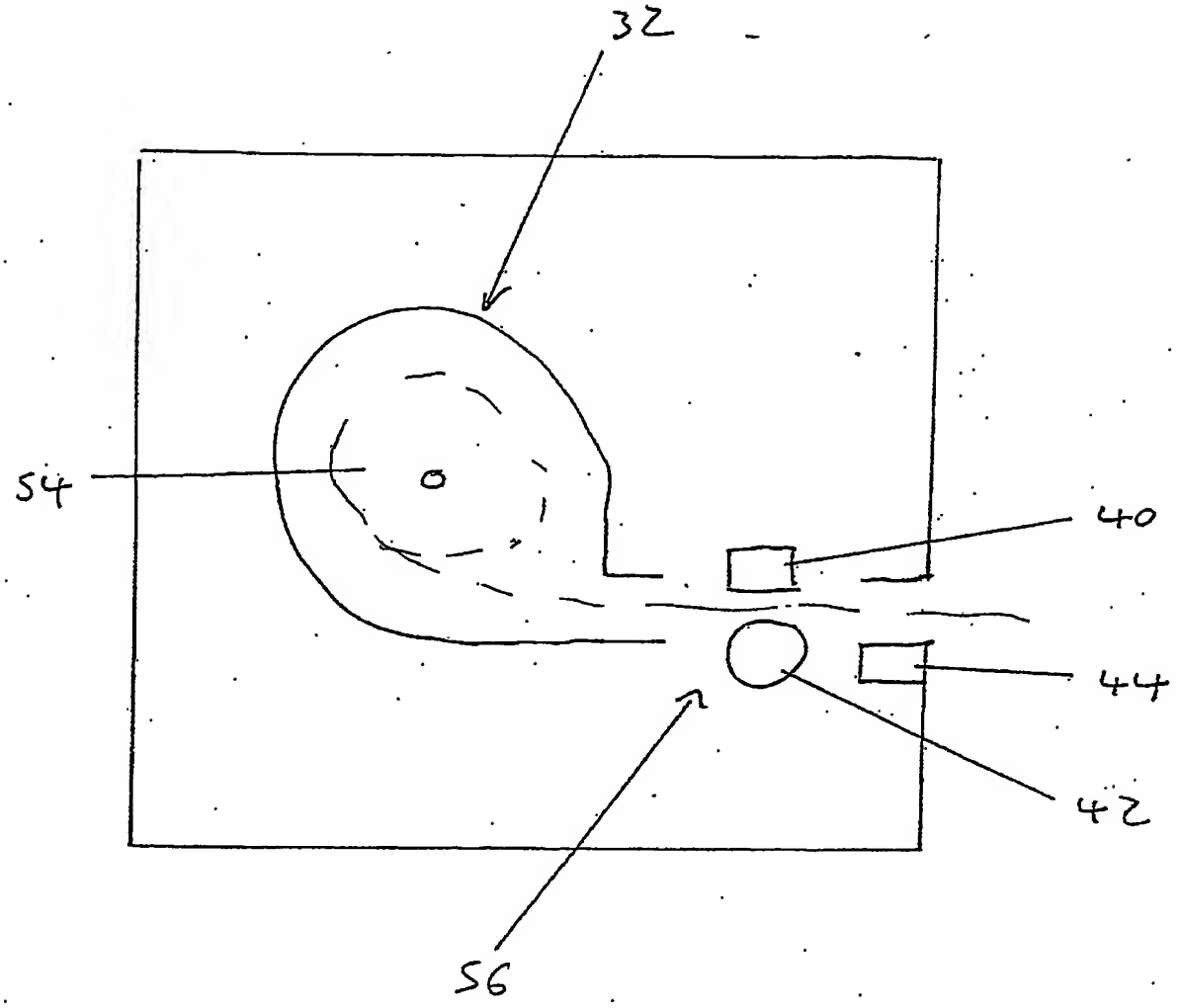


FIG 7

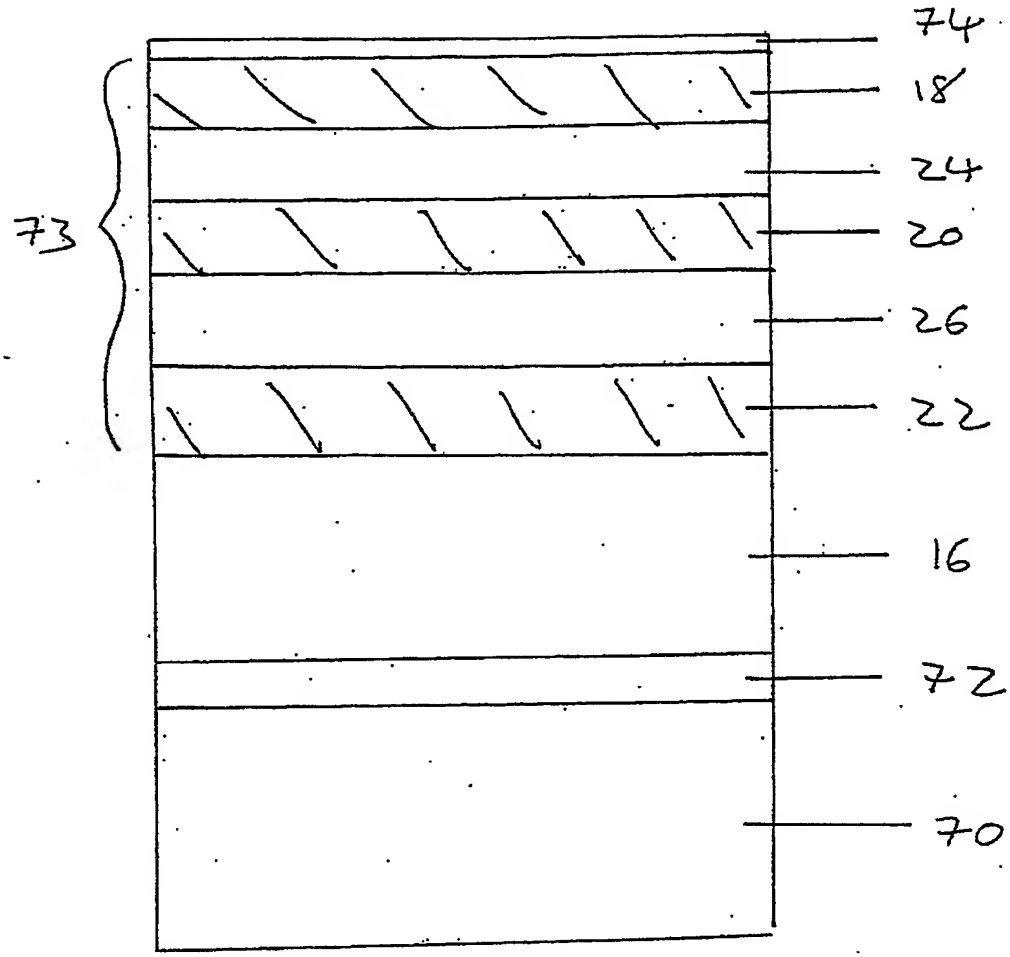


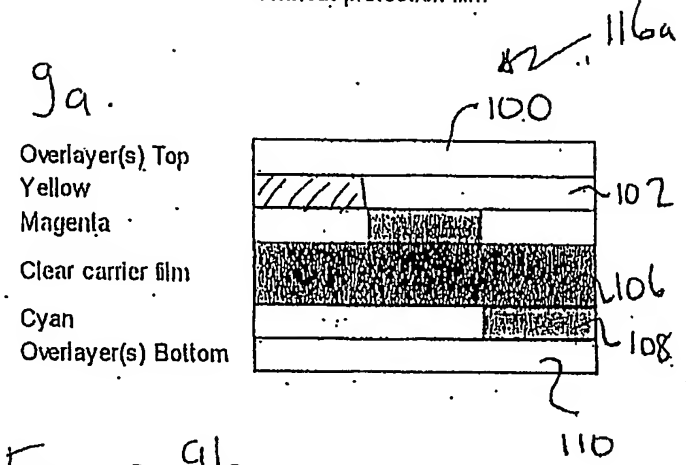
FIG. 8

FIGURE 9a-d

Double-sided

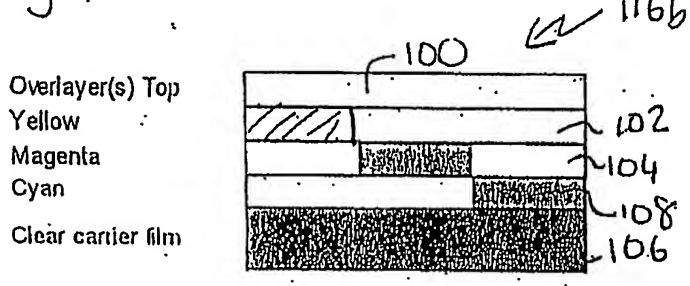
Without protection film

Fig 9a.



Single-sided

Figure 9b



With protection film

Figure 9c

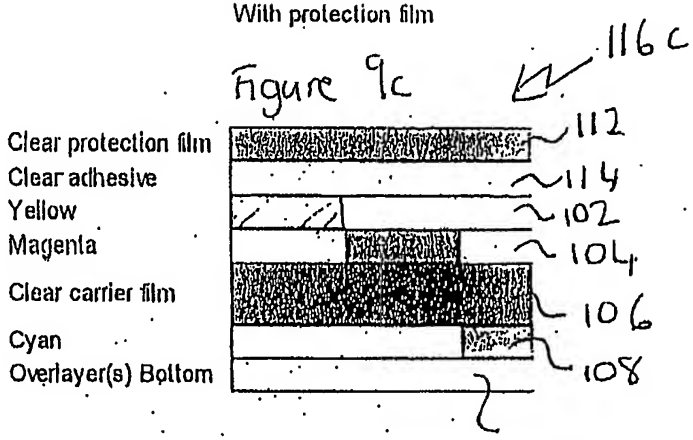


Figure 9d

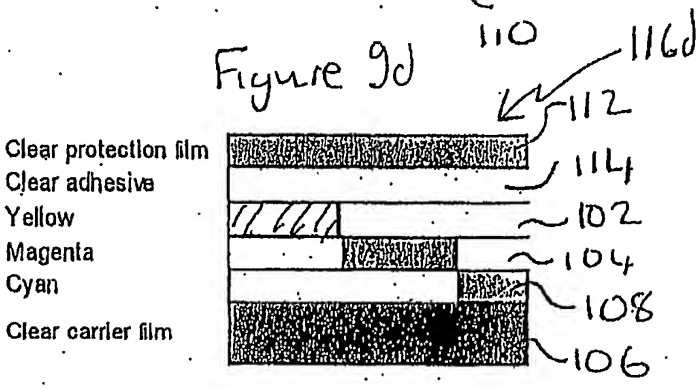


FIGURE 10 a

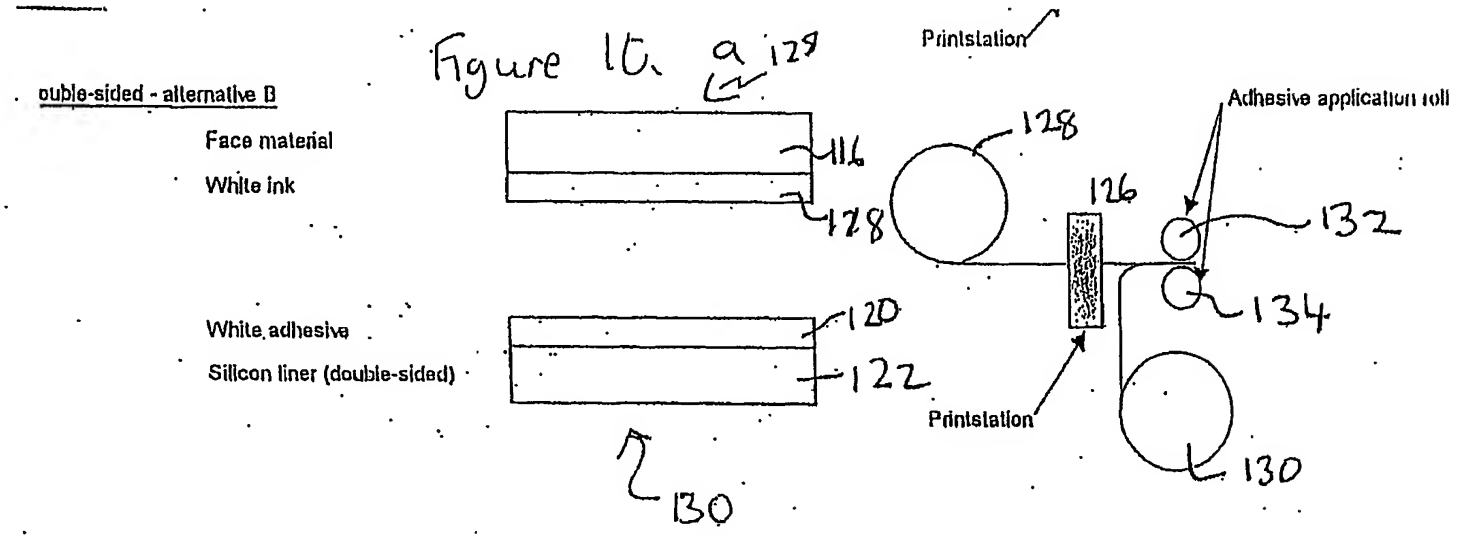


Figure 10a
129
Printstation
Adhesive application roll
ouble-sided - alternative B
Face material
White ink
116
128
126
132
134
White adhesive
Silicon liner (double-sided)
120
122
Printstation
130
130

Figure 10

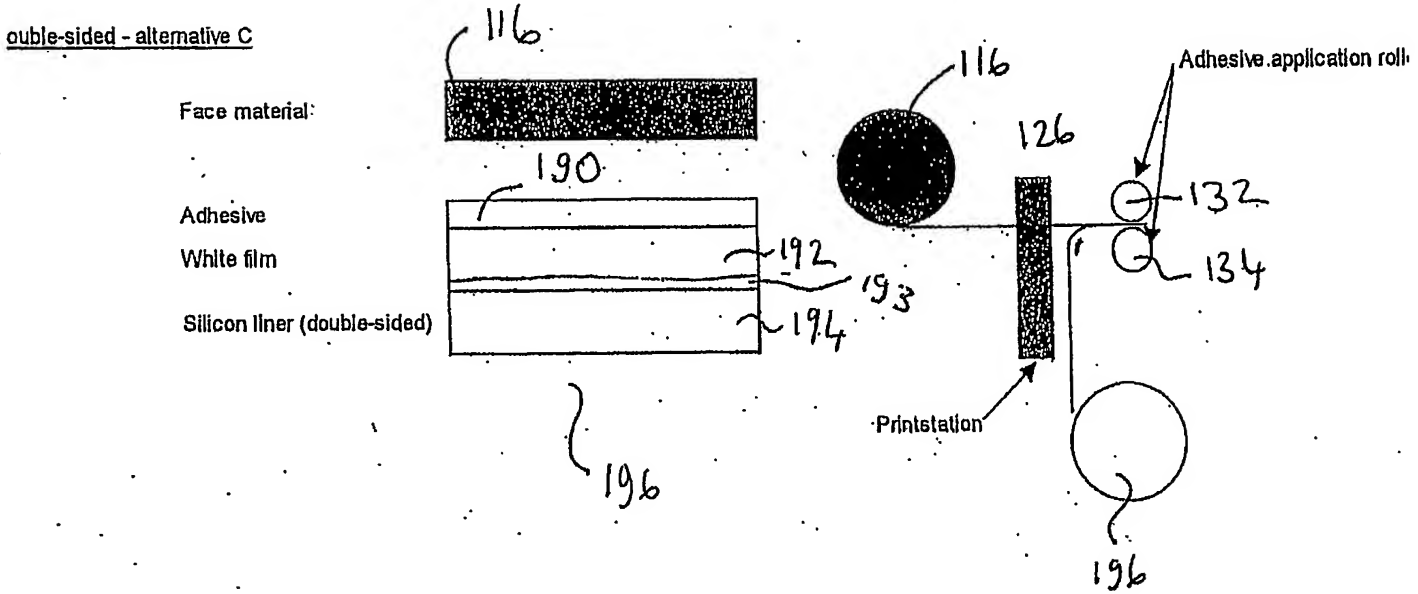

ouble-sided - alternative C
116
Face material
190
Adhesive
White film
192
193
Silicon liner (double-sided)
194
196
116
126
Adhesive application roll
132
134
Printstation
196

FIGURE 12

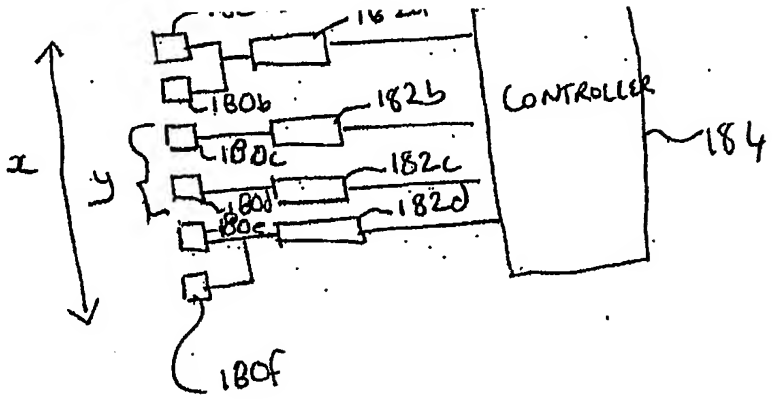


Figure 11a

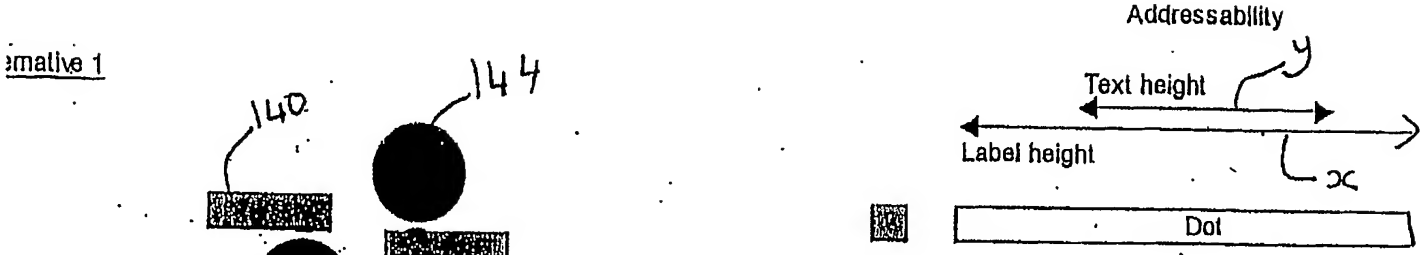
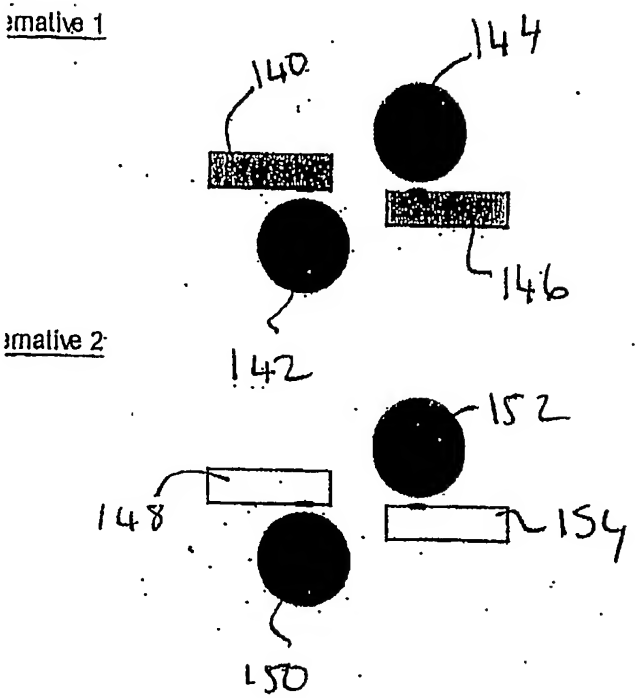
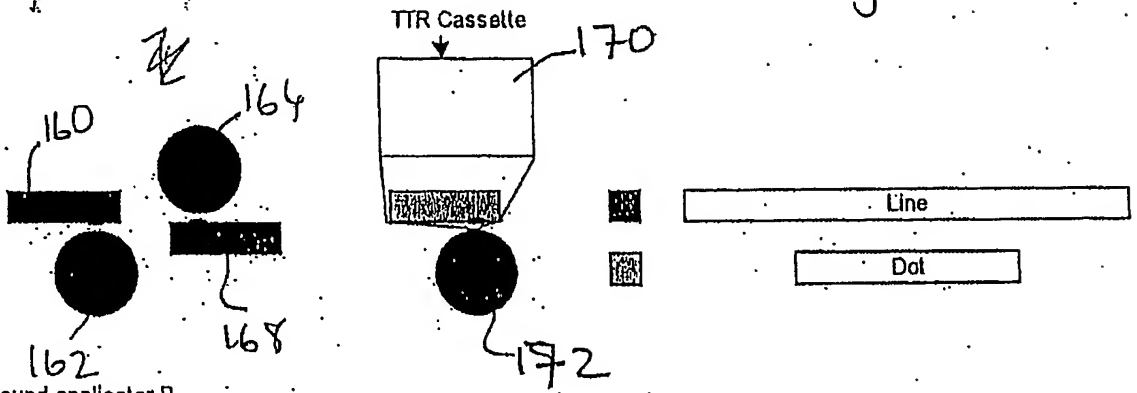


Figure 11b



Alternative 3: background applicator A

Figure 11 c



Alternative 4: background applicator B

Figure 11 d

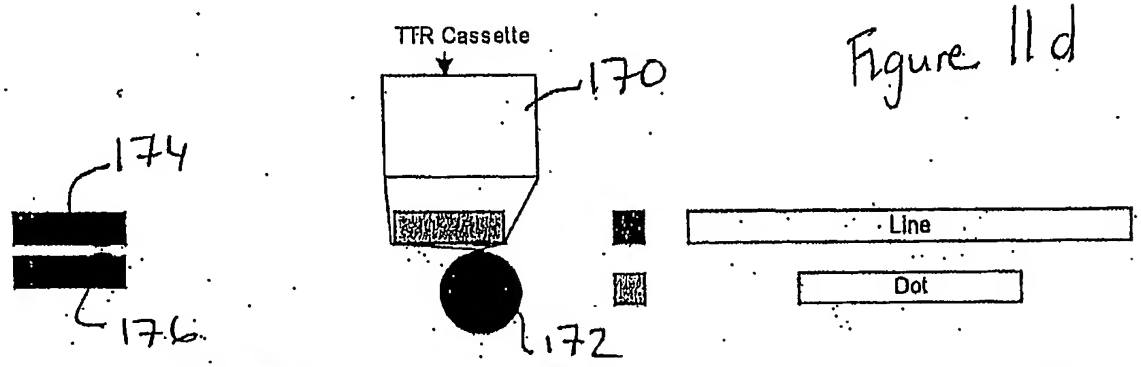


FIGURE 13a

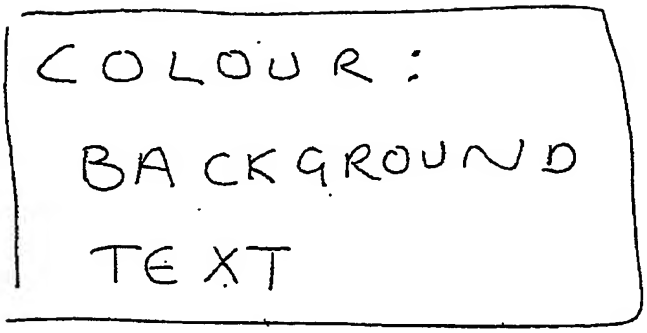


Figure 13b

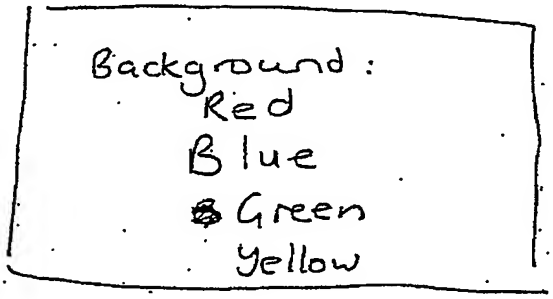


Figure 13c

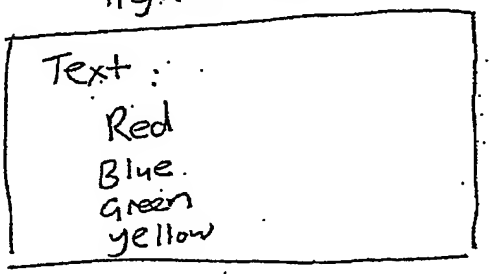


FIGURE 14a

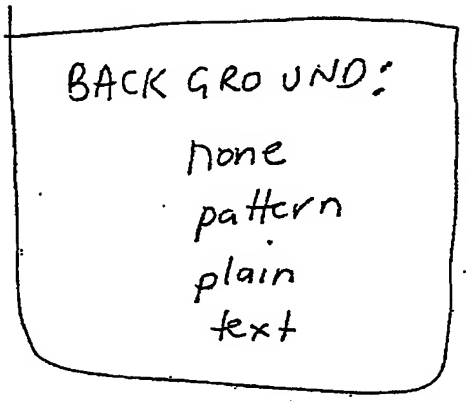
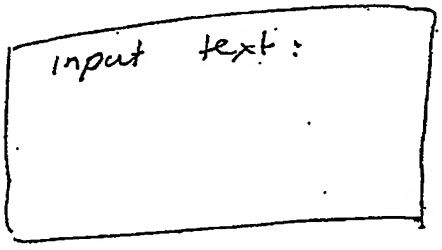
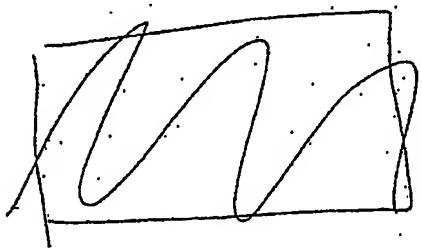


FIGURE 14b

Figure 14c





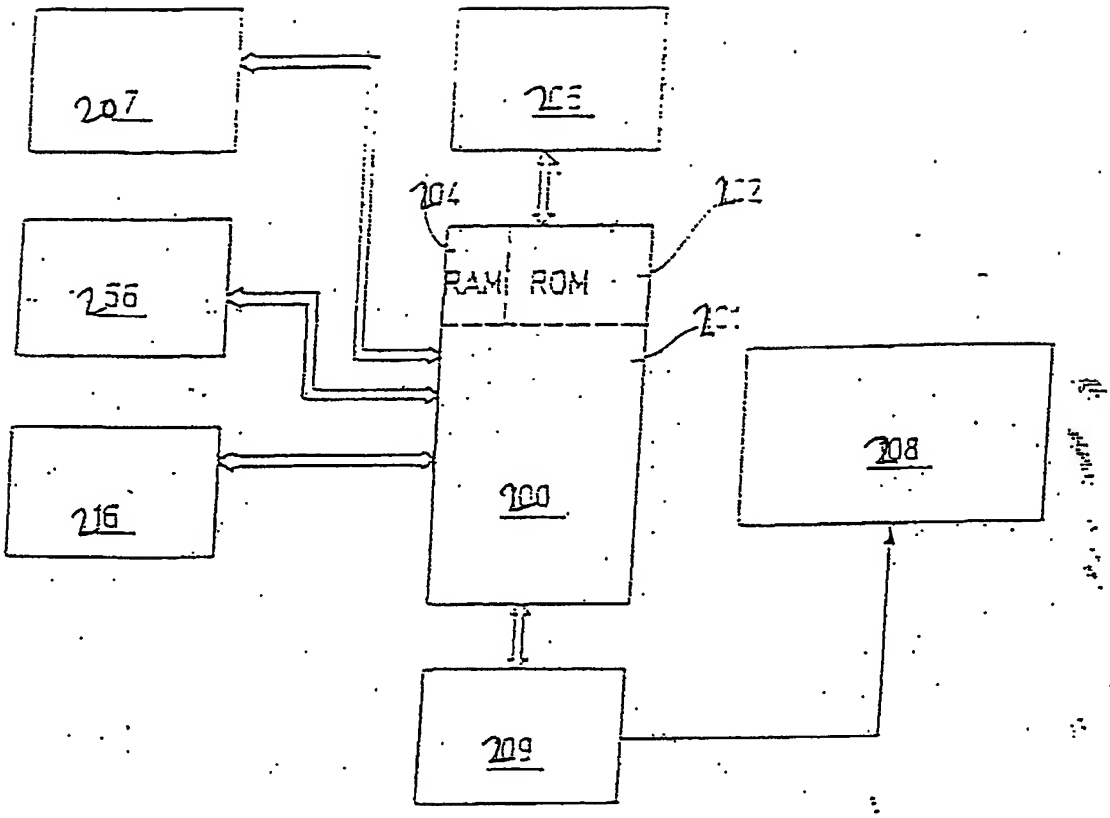


Figure 15

17120

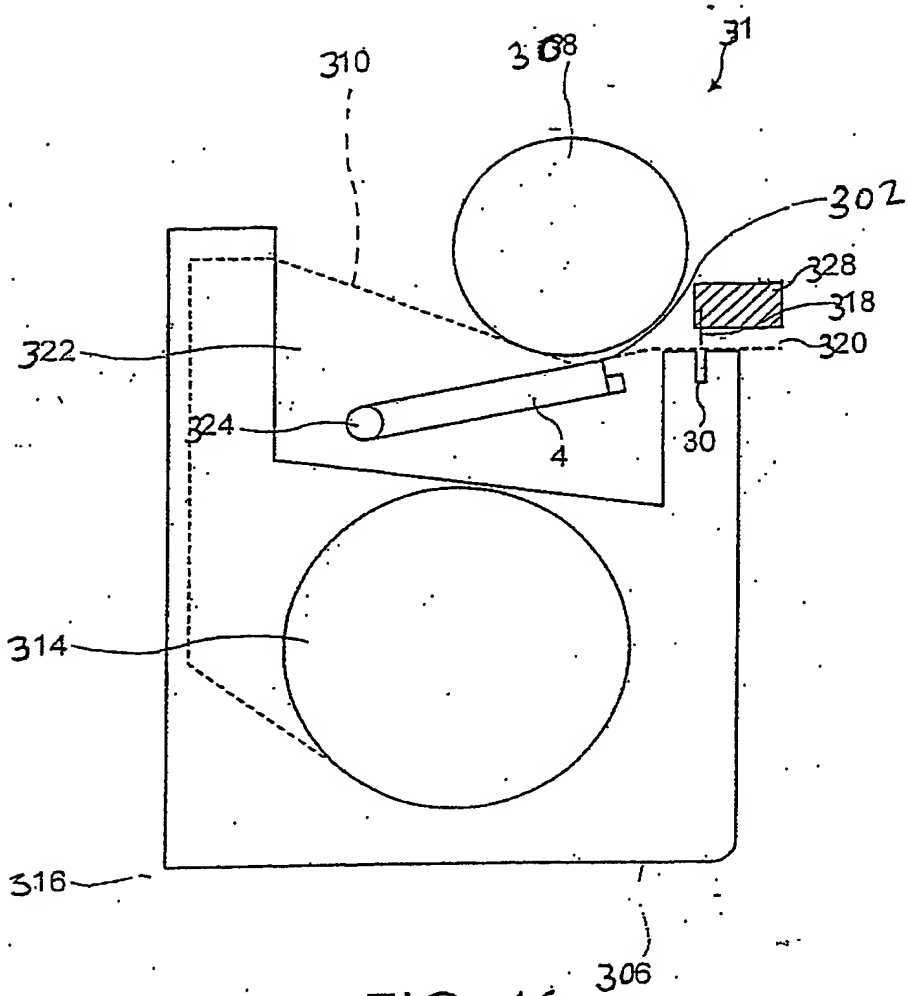


FIG. 16

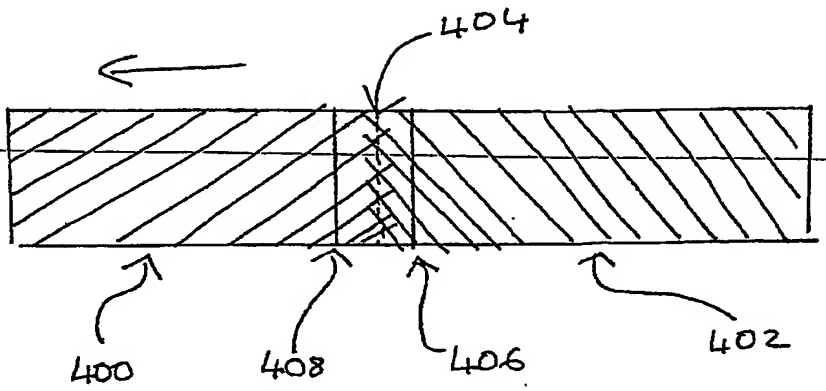


FIGURE 17

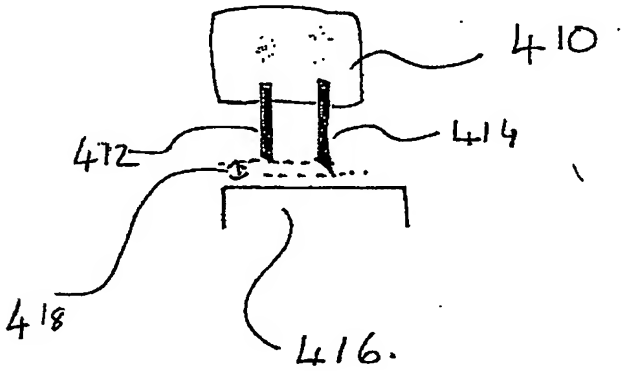


FIGURE 18

ABCLTD

FIGURE 19

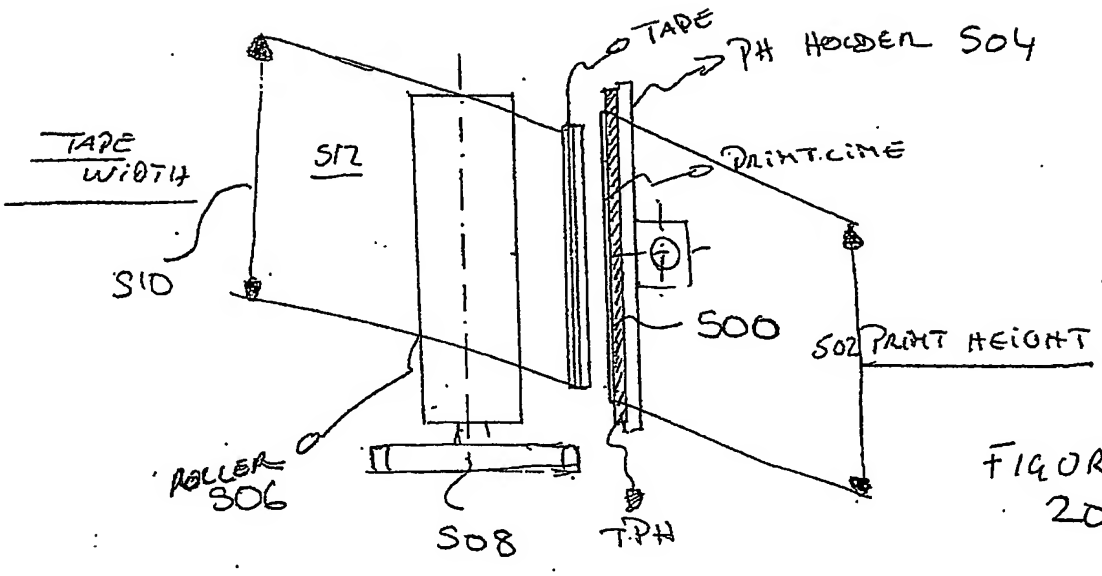


FIGURE 20

PRINT HEIGHT > TAPE WIDTH

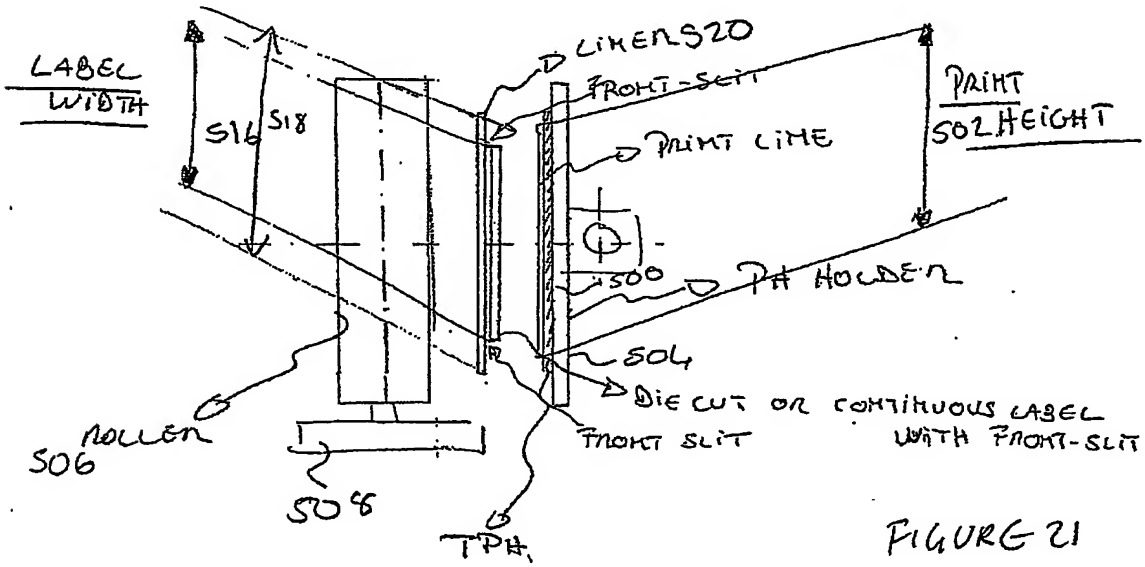
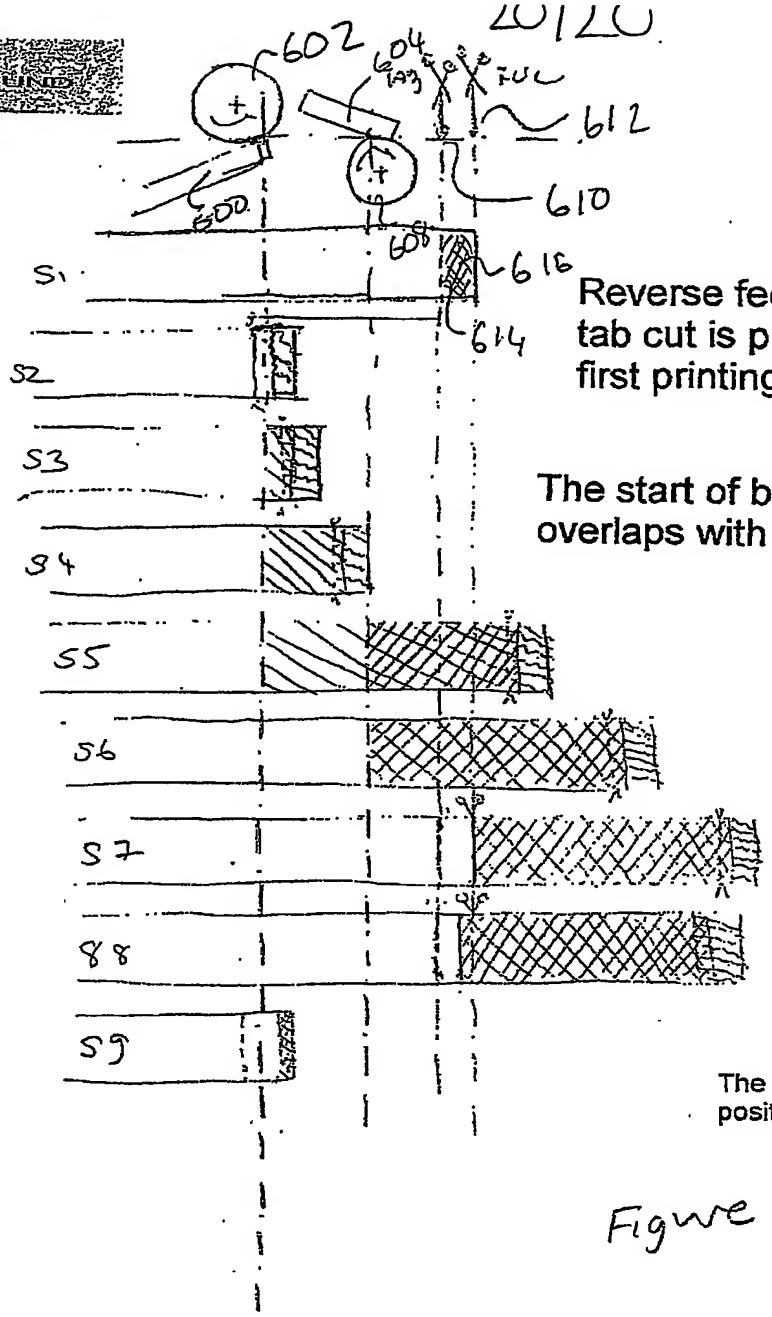


FIGURE 21

PRINT HEIGHT > LABEL WIDTH

FULL BACKGROUND



Reverse feeding so that the tab cut is positioned before first printing means

The start of background-printing overlaps with the tab-cut-portion

Cutting on the last printed line is difficult to achieve. Better is to cut at a distance less then the labellength. Part of the printing will then be on the tab cut portion

The tab-cut always needs to be positioned before the first printing line

Figure 22

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